

# APOCALYPSE CANCELLED

## THE GLOBAL WARMING DEBATE

*Scientists argue that the "hockey stick" graph used by the UN to demonstrate recent trends in global warming is based on a false algorithm, and leads to wrong conclusions being drawn.*

by **Christopher Monckton**  
(The Viscount Monckton  
of Brenchley)  
© 5 November 2006

Email: [monckton@mail.com](mailto:monckton@mail.com)

In the *Sunday Telegraph* articles for 5 and 12 November 2006, I have done my best to steer between the strongly held opinions and propaganda statements of climate change true-believers and contrarians alike. Climate change is an inescapably political issue. I have spent several months reading the leading scientific papers and assessing the arguments put forward, often with passionate conviction, by the protagonists on both sides.

The official case depends crucially on a series of assumptions whose truth has not been demonstrated, some of which are not easily testable. In particular, the temperature effect at the surface of the incompletely saturated peripheral absorption bands of CO<sub>2</sub> at the tropopause cannot be confidently estimated. Air and sea temperatures have failed to rise anything like as much as "global warming" theory predicts. Explanations for the shortfall of observed out-turn against theoretical projection are mutually inconsistent and scientifically dubious. I conclude that, on the balance of probabilities, the contrarians are significantly closer to the truth than the United Nations (UN) and its supporters.

— Monckton of Brenchley

### Is there a scientific consensus about global warming?

All climate scientists accept that there are more greenhouse gases in the air than there were, and that in consequence the world will warm somewhat. There is no consensus on the central question of how much warming there will be. The main area of dispute is about the magnitude of the temperature effect of carbon dioxide. Arrhenius (1896) was the first to calculate the effect of doubling atmospheric carbon dioxide, concluding that global temperature would rise by 8° C.

In the 1970s, experiments showed that at the Earth's surface the principal absorption bands of atmospheric CO<sub>2</sub> were saturated, and it was thought that a doubling of CO<sub>2</sub> might raise temperature by as little as 0.5° C. However, subsequent experiments indicated that in the much thinner air and much lower temperature at the tropopause—the top of the main atmospheric layer, around 5–11 miles up—the secondary absorption bands of CO<sub>2</sub> were not fully saturated. Some of the outgoing, long-wave radiation from the Earth's surface would be intercepted at the tropopause and scattered back into the troposphere. The UN's 1990 and 1996 Assessment Reports suggested that additional warming of 4.4 watts per square metre per second would occur. The 2001 report cut this figure to 3.7 watts. However, it is not clear how much of this additional energy reaches the surface. A submission to the UN by Dr Hugh Ellsaesser suggested that only 1.5 watts would reach the surface. See also De Laat et al. (2004) and Etheridge et al. (1996) for a discussion of man's contribution to the greenhouse effect. Leading climate scientists who strongly disagree with the view that additional carbon dioxide in the air will have the large effect on the climate suggested by the UN include Professor Richard Lindzen of the Massachusetts Institute of Technology, who recently received a £10,000 prize for courage in opposing conventional thinking. Some 41 scientists recently wrote to the *Telegraph* to say they were not part of, and were not convinced by, the "global warming" consensus.

**Contrarians and the fossil fuel lobby:** The Royal Society, in a current pamphlet entitled "A guide to facts and fictions about climate change", says: "There are some individuals and organisations, some of which are funded by the US oil industry, that seek to undermine the science of climate change and the work of the [UN] Intergovernmental Panel on Climate Change."

Environmentalists say that Exxon Mobil, in particular, has provided funding to organisations that disagree with the "consensus" view on climate change. See, for example, <http://www.exxonsecrets.org>.

On the other hand, the Royal Society is subsidised by the UK government, and most scientists worldwide are State-funded. It has been said that the fundamental equation of State-subsidised science is "No Problem Equals No Funding". The *Sunday Telegraph* article intentionally avoids point-scoring of this kind, on either side of the debate, and is directed not *ad hominem* but *ad rem*. As for UK funding of the UN's technical panel on climate change, the UN's documents occasionally acknowledge the British government's funding.

### Did rising carbon dioxide end the ice ages?

The double graph, reproduced below, lists CO<sub>2</sub> concentration above temperature; but, if the two graphs were superimposed at sufficient scale, as is customary when comparing such similar curves, changes in temperature would be seen to *precede* changes in CO<sub>2</sub> concentration by 400 to 4,000 years. Petit et al. (1999) state that during each of the last four interglacial periods, the Earth was warmer than the current warm period.

### Was there a mediaeval warm period?

Were mediaeval temperatures at least as high as today's? This question is central to answering the question of whether "global warming" is or will become dangerous to the planet.

Until the UN's 2001 report, the existence of a warm period of about 500 years between c. AD 950 and c. 1450 had not been controversial. The mediaeval warm period formed part of a natural cycle of climatic variations that had been apparent since the end of the last ice age ~12,000 years ago.

According to Villalba (1990, 1994), as well as Soon and Baliunas (2003), the mediaeval warm period was warmer than the current warm period by up to 3° C. From c. 1000, ships were recorded as having sailed in parts of the Arctic where there is a

permanent ice-pack now (Thompson et al. 2000; Briffa 2000; Lamb 1972a, b; Villalba 1990, 1994).

In 1421, a Chinese Imperial Navy squadron sailed right round the Arctic and found no ice anywhere. It is possible that at that time there was less of an icecap at the North Pole than there is now, particularly in summer. Yet the polar bears survived. Though there has been much discussion of the supposed threat posed by the warmer Arctic, the polar bears are thriving in the current warm period. Eleven of the 13 principal known families are prospering as never before.

**Greenland in the Middle Ages:** Erik the Red had named Greenland "Greenland" to encourage Danish settlers, because in his time south-western Greenland was indeed green. It was ice free, and was extensively cultivated until c. 1425, when the farms were suddenly overrun by permafrost.

The Viking agricultural settlements remain under permafrost to this day—a powerful indication that the Middle Ages were warmer than the present, and that there is little cause for alarm at the current melting of Greenland glaciers because they are very likely to have melted to more than their present extent during the mediaeval warm period.

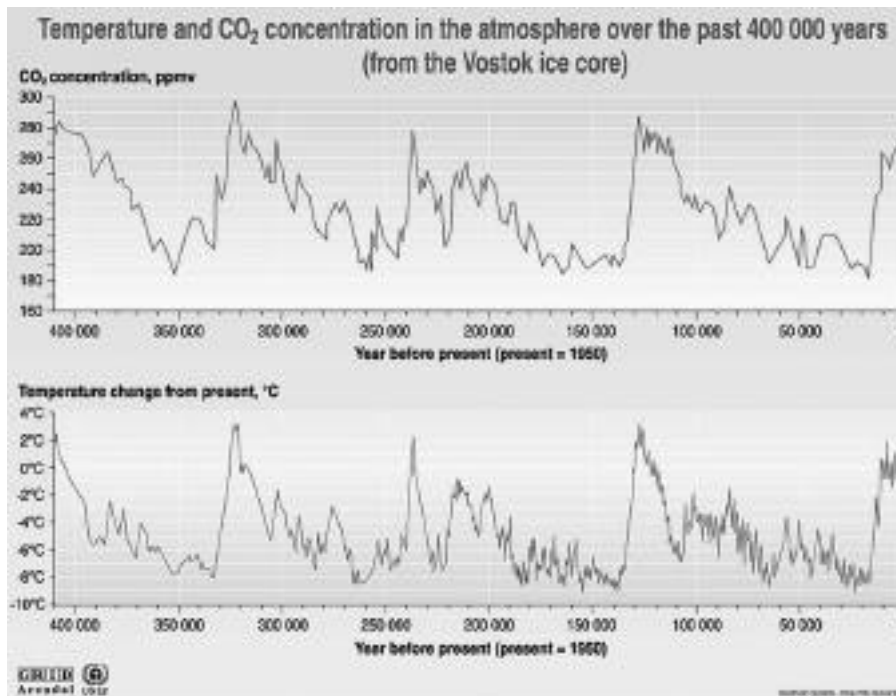
**The "little ice age":** The mediaeval warm period was followed by a 300-year "little ice age" until c. 1750. At the beginning of this period, mean temperatures dropped by 1.5° C in 100 years. The coldest period was c. 1550 to 1700 (Jones et al. 1998; Villalba 1990, 1994). Frost fairs were held on the frozen River Thames in London.

Not only is the mediaeval warm period not shown on the UN's graph of temperature over the past 1,000 years, the little ice age is also absent. From c. 1750, temperatures rose and held steady until the late Victorian era. These temperature fluctuations were not caused by humankind's activities. The UN's 1996 report included a graph illustrating them. By the time of the 2001 report, the UN had eradicated the mediaeval warm period.

### The "hockey stick" graph controversy

The UN's 2001 graph, variously known as the "hockey stick" or "foxtail" or "J-curve", first appeared in *Nature* (Mann et al. 1998) and then, the following year, in *Geophysical Research Letters* (Mann et al. 1999). After its appearance in the UN's 2001 report, McIntyre et al. (2003, 2005) demonstrated that the erasure of the mediaeval warm period in the 2001 graph had been caused by inappropriate data selection and incorrect use of statistical methods.

The first mistake made by Mann et al., and copied by the UN in 2001, lay in the choice of proxy data. The UN's 1996 report had recommended against reliance upon bristlecone pines as proxies for reconstructing temperature, because 20th-century carbon dioxide fertilisation accelerated annual growth and caused a false appearance of exceptional recent warming. Notwithstanding the warning against reliance upon bristlecones in the UN's 1996 report, Mann et al. had relied chiefly upon a series of bristlecone-pine datasets for their reconstruction of mediaeval temperatures. Worse, their



Temperature and CO<sub>2</sub> concentration in the atmosphere over the past 400,000 years (Vostok ice core).

For more detail, refer to [http://maps.grida.no/go/download/mode/plain/f/26\\_large.jpg](http://maps.grida.no/go/download/mode/plain/f/26_large.jpg).

statistical model had given the bristlecone-pine datasets 390 times more prominence than the other datasets they had used.

To McIntyre et al., it appeared possible that Mann et al. had given the tainted bristlecone data series such exceptional prominence, effectively swamping all influence from the other datasets in their calculations, because the bristlecone-pine dataset produced the pronounced 20th-century uptick (and a corresponding suppression of evidence for mediaeval high temperatures), which would apparently eradicate the mediaeval warm period. To test this possibility, McIntyre et al. ran the algorithm of Mann et al. 10,000 times, having replaced all palaeoclimatological data with randomly generated, electronic "red noise". They found that—even with this entirely random data, altogether unconnected with the temperature record—the model nearly always constructed a "hockey stick" curve similar to that in the UN's 2001 report.

McIntyre and McKittrick (2003, 2005) also tested the algorithm of Mann et al. (1998; UN 2001) without the bristlecone-pine data, whereupon the mediaeval warm period reappeared. They also found that Mann et al. had excluded from their calculations a single dataset covering the later mediaeval warm period, which had been stored in a computer file marked "CENSORED\_DATA". McKittrick ran the Mann et al. model including the missing dataset, and again found that the mediaeval warm period reappeared.

Several eminent scientists have commented on the work of McIntyre and McKittrick. For instance, Richard Muller (2004), a physicist at Berkeley, said of the two Canadian scientists' work:

"That discovery hit me like a bombshell, and I suspect it is having the same effect on many others. Suddenly the hockey stick, the poster-child of the global warming community, turns out to be an artifact of poor mathematics."

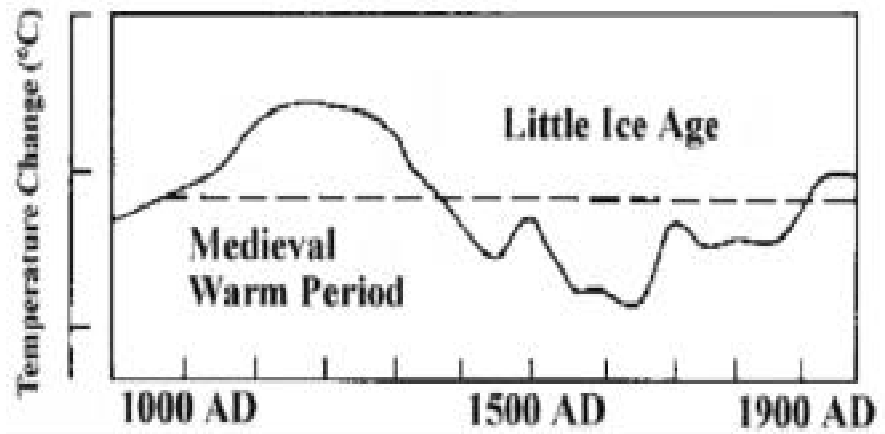
Dr Rob van Dorland (2005), of the Dutch National Meteorological Agency, said:

"It is strange that the climate reconstruction of Mann passed both peer review rounds of the IPCC without anyone ever really having checked it."

In February 2005, the German television channel Das Erste interviewed Ulrich Cubasch, a climatologist, who said that he had been unable to reproduce the Mann et al. "hockey stick" graph, whereupon he:

"...discussed the objections with his colleagues, and sought to work them through... Bit by bit, it became as clear to his colleagues as it had to him: the two Canadians were right. Between 1400 and 1600, the temperature shift was considerably higher than, for example, in the previous century. With that, the core conclusion, and also that of the entire IPCC 2001 Report, was completely undermined."

Dr Hendrik Tennekes, retired director of research at the Royal Meteorological Institute of The Netherlands, wrote to Dr McIntyre in 2005 to say:



Temperature history from the United Nations 1996 report, showing the mediaeval warm period.

"The IPCC review process is fatally flawed... The scientific basis for the Kyoto Protocol is grossly inadequate."

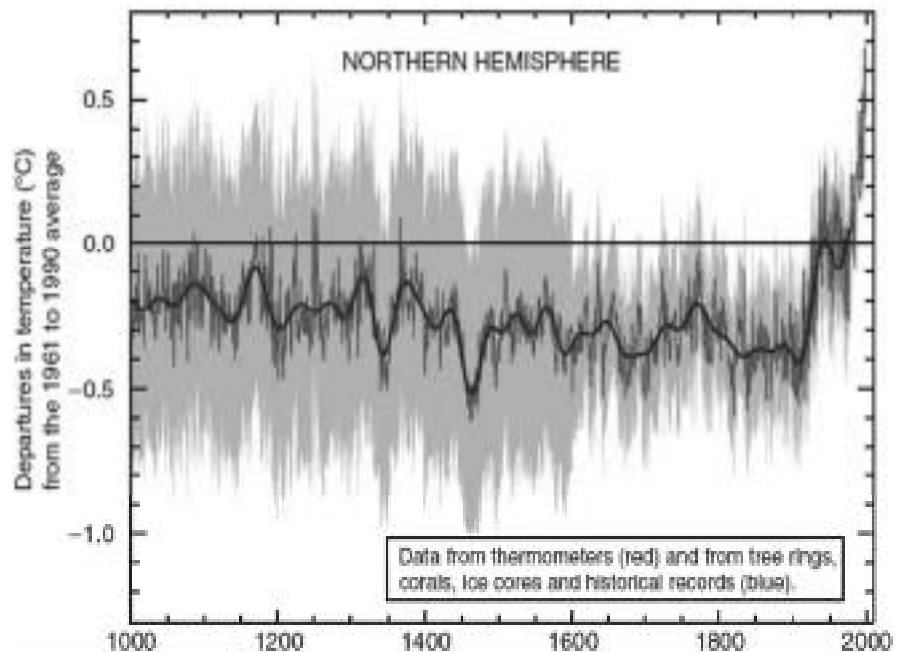
However, the fact that the central graph of the UN's 2001 report was defective has not had anything like as much attention from the media as the stories of impending disaster which politicians—and the UN itself—have derived from it.

The preface to the UN's 2001 report says the intention of its Climate Change Panel is to provide objective information as a basis for decisions by policymakers. The introduction adds:

"Since the release of the Second Assessment Report, additional data from new studies of current and palaeoclimates, improved analysis of data sets, more rigorous evaluation of their quality, and comparisons among data from different sources have led to greater understanding of climate change."

Despite "rigorous evaluation" by the UN, involving not one but two rounds of detailed scrutiny by peer review, the errors in the key temperature reconstruction graph were not detected—or, if they were detected, they were not corrected.

This defective graph is the only figure which was featured as many as six times in the UN's 2001 report, appearing with great



"Hockey stick" from UN 2001 report. The mediaeval warm period is absent.

prominence and in full colour on each occasion. The centrality of its importance to the case for alarm may be judged not only from the frequency and prominence of its appearance in the UN's 2001 report but also from the following conclusion, which appears in the Summary for Policymakers:

"New analyses of proxy data for the Northern Hemisphere indicate that the increase in temperature in the 20th century is likely to have been the largest of any century during the past 1,000 years. It is also likely that, in the Northern Hemisphere, the 1990s was the warmest decade and 1998 the warmest year (Figure 1b). Because less data are available, less is known about annual averages prior to 1,000 years before present and for conditions prevailing in most of the Southern Hemisphere prior to 1861."

The UN relied not only upon the flawed Mann et al. reconstruction but also upon a series of similar papers contributed to scientific journals, which seemed to support the abolition of the mediaeval warm period, as a report by the House of Lords Economic Affairs Committee (Lords 2005) pointed out.

However, an independent report by statisticians (US Senate 2005), perhaps the most devastating scientific criticism yet levelled at the UN on climate change, concluded not only that the UN's 2001 temperature reconstruction had used inappropriate statistical methods and data but also that many of the supporting scientific papers, both before and after the 2001 report, had been written by a small and closely connected group of palaeoclimatologists who effectively dominated their field worldwide and were all intimately linked to the principal author of the UN's 2001 graph.

It was not until prolonged pressure had been exerted upon the editors of *Nature* that a (less than complete) corrigendum was published (Mann et al. 2004).

Not only *Nature* but also other leading peer-reviewed scientific journals had refused to publish the first paper by McIntyre et al. (2003) exposing the flawed graph. Eventually, *Geophysical Research Letters* (McIntyre & McKittrick 2005) had the courage to break ranks and publish the truth.

The US National Academy of Sciences has since issued a statement that the "hockey stick" graph is defective. Significantly, however, the UN has issued no statement of apology or correction. It continues to use the "hockey stick" in its publications.

The Government of Canada circulated a copy of the graph to every household in the nation, together with the alarmist conclusion drawn by the United Nations. The Canadian Government did not subsequently circulate any correction.

Using comparisons among data from different sources, it is possible to answer the questions of whether there was a mediaeval warm period, whether it was global and whether it was warmer than the current warm period. The US Senate (2005) produced the following graph summarising the findings of several recent palaeoclimatological studies.

It is not likely that temperatures sufficiently high to keep southwest Greenland sufficiently free of ice to permit widespread cultivation, and to remove much or all of the north polar icecap

during the summer months, were a purely regional phenomenon.

Soon and Baliunas (2003) reviewed more than 200 proxy studies and concluded that the 20th century is probably not the warmest or a uniquely extreme climatic period of the last millennium. Their paper was heavily criticised by "consensus" scientists on the ground that the data in several of the studies were not temperature data. Four of the editors of the journal that published the paper resigned in protest at the failure of the peer-review process to prevent publication. Their reaction is in strong contrast with that of the editors of *Nature*, none of whom resigned once they knew that the "hockey stick" graph which they had published was defective, and of the UN, which failed to publish any correction after the six-times-repeated graph was confirmed

to have been defective, and, as noted above, continues to use the defective graph in its publications.

To resolve the controversy, it is insufficient merely to rely upon the fact that the UN's graph was not fit for its purpose. It will be necessary to give an account of several of the independent proxy temperature studies published in recent years. The award-winning, contrarian website of the energetic Idso family of scientists, at <http://www.co2science.org>, provides clear and fair summary of papers relevant to the climate change debate. Their Mediaeval Warm Period database is relevant here.

To balance the considerable northern hemisphere evidence for the mediaeval warm period, some of which has already been discussed, here are a dozen studies from the southern hemisphere... [See full report. Ed.]

I conclude that today's temperatures are not exceptional, and that the mediaeval warm period was at least as warm as the present and probably up to 3° C warmer. However, its timing and extent varied somewhat from place to

place, as is to be expected given the mathematically chaotic nature of climate.

#### **Editor's Note:**

The full text of Christopher Monckton's research report, including discussion, calculations and references, is available at <http://www.telegraph.co.uk/news/graphics/2006/11/05/warm-refs.pdf>. Articles summarising his research were published in the London *Sunday Telegraph* on 5 and 12 November 2006 and are available at <http://www.telegraph.co.uk>.

For additional information, refer to Dr David E. Wojcik's article "The UN IPCC's Artful Bias on Climate Change", published in NEXUS vol. 9, no. 6, 2002.

#### **About the Author:**

Christopher Monckton is The Viscount Monckton of Brenchley, born in 1952 and educated at Harrow, Churchill College, Cambridge, and University College, Cardiff. He has had a distinguished career as a journalist/editor, worked in the Prime Minister's Policy Unit in 1982-86, and in 1986 founded his public administration consultancy firm Christopher Monckton Ltd. He is the inventor of the Eternity and Sudoku X puzzles and the author of five *Daily Mail* Sudoku X books. He can be contacted by email at [monckton@mail.com](mailto:monckton@mail.com).

**The US National Academy of Sciences has since issued a statement that the "hockey stick" graph is defective.**

**Significantly, however, the UN has issued no statement of apology or correction. It continues to use the "hockey stick" in its publications.**